

# **Armstrong World Industries, Inc. (AWI)**

# **Macon Naval Ordnance Plant (MNOP)**

## **Open House**

**Bruce Elementary School  
3660 Houston Road  
Macon, GA  
6:00 – 8:00 PM**


**November 12, 2019**



# AWI OU2 & MNOP Personnel

- U.S. Environmental Protection Agency (EPA)
  - Lead Agency
    - Brian Farrier, Remedial Project Manager
    - Ron Tolliver, Community Relations
- Georgia Environmental Protection Division (GAEPD)
  - Support Agency
    - Kim Hembree, DoD Facilities Unit
- Armstrong World Industries (AWI OU2)
  - Environmental Planning Services, Inc.
    - Joe Nicolette
- Macon Naval Ordnance Plant (MNOP Site)
  - Environmental Resources Management
    - Martin Crook





# Superfund's National Priorities List

- 1980: Congress passes Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
  - More commonly known as Superfund
  - Addresses hazardous substances in the environment
  - Generally, removal authority addresses short-term threats
    - AWI OU1: WWTP Landfill, Non-Time Critical Removal Action
  - Generally, remedial authority addresses long-term threats
    - AWI OU2, MNOP



# NPL Remedial Process

- 2011: AWI listed on Superfund's NPL  
2013: MNOP listed on Superfund's NPL
  - Potentially Responsible Party Search (PRPs)
  - Sep 2015: *PRP Negotiations Begin for RI/FS (both AWI OU2 & MNOP)*
  - 2015-16: EPA Conducts Vapor Intrusion Investigations (MNOP)
  - Sep 2018: *PRP Negotiations Finalized for RI/FS (both AWI OU2 & MNOP)*
  - Sep 2019: RI/FS Workplans Finalized
- ***Remedial Investigation: determines contamination & risks***  
***(Both RIs Field Work Began October 28, 2019)***  
***Feasibility Study: assesses options for cleaning up risks***
- Proposed Plan For Remedial Action (includes public comments)
- Record of Decision
- Remedial Design
- Remedial Action
- Operation & Maintenance
- NPL Deletion



# AWI & MNOP History

1948: AWI begins ceiling tile manufacturing

~450 employees producing ~400 million square feet/year ceiling tile

Three landfills on AWI Property:

- Woodyard Landfill

*2004: Capped under GAEPD oversight in 2004*

- WWTP Landfill

*2016: Addressed under Superfund as Operable Unit One (OU1)*

- Remote Landfill

To Be Addressed Under OU2 (w/ FMNOL Landfill & Rocky Creek)

## Macon Naval Ordnance Plant (MNOP)

- 1941-1945: US Navy/Reynolds Corporation. Ordnance Manufacturing
- 1945-1965: US Navy. Ordnance Manufacturing, Metal Plating
- 1965-1973: Maxson Electronics. Ordnance Manufacturing
- 1973-1981: Allied Chemical. Seat belt Manufacturing
- 1980: Allied Industrial Park Operated by Macon-Bibb County
- 1990s: Multiple Investigations by US Army Corps of Engineers
- FMNOL Landfill is adjacent to AWI Remote Landfill
- Groundwater Impacted by High Levels of Trichloroethylene (TCE)



# AWI Operable Units

- Operable Units (OUs)
  - At Superfund Sites Work Is Often Conducted in Separate Parts, Called Operable Units
- AWI OU1: Waste Water Treatment Plant (WWTP) Landfill
  - 2016: Construction Completed w/ Superfund Removal Authority
  - Engineered Cap/Liner System with Mechanically Stabilized Earthen Wall, Drainage Swale Replaced Pollinator Meadow
- AWI OU2: Rocky Creek, Remote Landfill, & FMNOL
  - Rocky Creek: fish, biota, sediment
  - Remote Landfill & FMNOL are essentially one landfill
  - FMNOL: Former Macon Naval Ordnance Landfill
- MNOP: Currently Does Not Have Separate OUs Planned



# AWI & MNOP Major Risk Drivers

- **Rocky Creek: Do Not Eat Fish Downstream of Houston Road**
  - 1996-98: Army Corps of Engineers Fish Sampling  
Polychlorinated Biphenyls (PCBs) in Fish  
Signs Posted at RR Trestle and at Highway 247 (Houston Rd)  
2013: Public Health Assessment Conducted by GADPH (GA Dept of Public Health)
  - Okmulgee River: Not Impacted by PCBs  
Former Consumption Guideline for Flathead Catfish Has Been Removed  
Current Consumption Guideline for Largemouth Bass (One Meal/Week, Mercury)
- **Groundwater Beneath MNOP Impacted by Trichlorethylene**
  - Navy Waste Water Treatment Plant
    - High Levels of Trichloroethylene (TCE)
  - This Groundwater Is Not Used For Drinking Water
  - Vapor Intrusion to Indoor Air at Site Buildings
- **Residential Areas to North Not Impacted (Lynmore Estates)**
  - 2012: Composite Soil Sample Along Guy Paine Rd. Did Not Detect PCBs



# Macon Naval Ordnance Plant

## TCE Groundwater Plume as of 1998 (USACE)

Guy Paine Road



Wells hi-lited orange  
re-sampled in 2009  
(EPA ESI)

Wells hi-lited yellow re-  
sampled in 2015 (EPA VI  
Investigation)

Rocky Creek



# MNOP and Vapor Intrusion

- Vapor Intrusion is a process where chemicals in groundwater can vaporize then seep through building foundations to contaminate indoor air
- Groundwater beneath the MNOP Site is contaminated with trichloroethylene (TCE) which is a volatile organic chemical
  - TCE is one of the most common contaminants at Superfund sites nation-wide
- EPA's experience with assessment and mitigation of vapor intrusion has increased considerably in recent years
  - EPA's VI guidance was finalized in June 2015 and can be found at <http://www.epa.gov/oswer/vaporintrusion/>

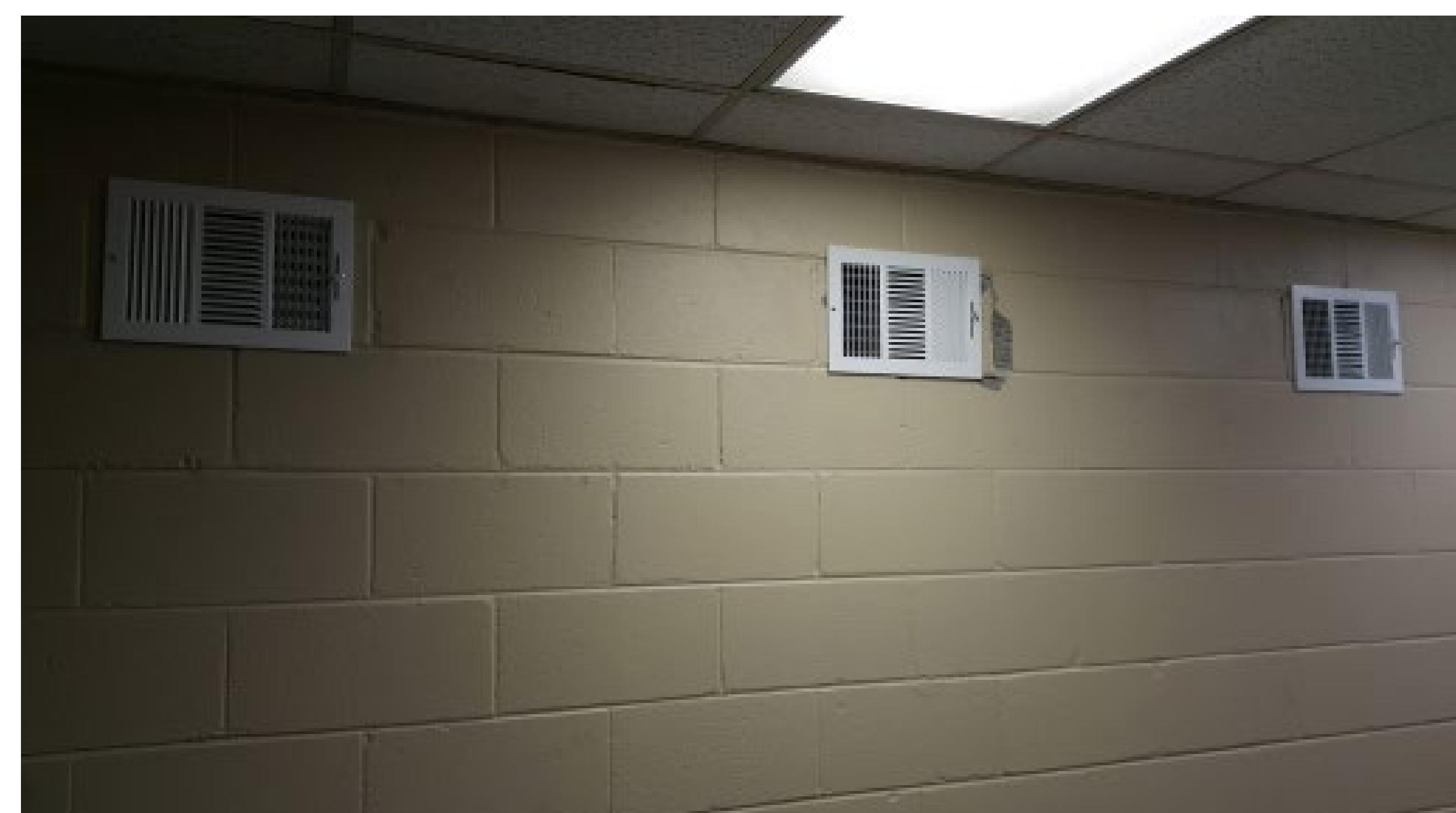


# EPA's Vapor Intrusion Investigations @ MNOP

## Trichloroethylene (TCE)

- EPA Conducted This Sampling Since PRP Negotiations Had Not Begun
- February/April 2015: Air Sampling at Freudenberg Texbond
  - **230 ug/m<sup>3</sup>** TCE in Indoor Air of Employee Break Room
    - 9-27 ug/m<sup>3</sup> TCE is Considered Acceptable For Site Workers
- August 2015: EPA TAGA Conducted Air Sampling at Twenty Buildings
  - TAGA: EPA's Mobile Air Laboratory (Trace Atmosphere Gas Analyzer)
  - Elevated TCE Level Also Found at SD Polymers Laboratory
  - Other Buildings Did Not Have Unacceptable Levels
- Dec-May 2016: TCE Levels at Both Buildings Mitigated to Acceptable Levels

TCE levels in indoor air were lowered at this location by increasing air circulation in the room



Air sample canister collecting a 24-hour sample at this location



# Potentially Responsible Parties

- AWI OU1 (WWTP Landfill)
  - Armstrong World Industries was the sole PRP
- AWI OU2 (Remote Landfill, FMNOL, Rocky Creek)
  - Respondents:
    - Armstrong World Industries
    - Macon-Bibb County
    - Macon Water Authority
    - Honeywell International Inc.
    - Reynolds Metals Company, LLC
    - The Unimax Corp.
  - U.S. Navy (Settling Federal Agency)
- MNOP
  - Performing Respondents:
    - Honeywell International Inc.
    - Reynolds Metals Company, LLC
    - The Unimax Corp.
  - U.S. Navy (Settling Federal Agency)
  - Cashout Respondents (Seven @ \$17,633 each)



# Community Outreach

- March 2011: Community Interviews
- April 2011: County Commission, City Council Briefed (AWI OU1)
- April 2011: Public Availability Session (AWI OU1)
- March 2012: Public Availability Session (MNOP)
- March 2013: Public Notice/Comment for Response Action (AWI OU1)
- April 2013: Macon-Bibb Industrial Authority (MNOP)
- June 2015: Tenants & MBIA Briefed on MNOP Site Status & VI Results
- July 2015: Press Release on MNOP Vapor Intrusion Results
- 2010-2015: TV/Newspaper Coverage
- Region 4 Web Pages for AWI and MNOP
  - <https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.Stayup&id=0410033#Stayup>
  - <https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.Stayup&id=0405304#Stayup>



# AWI OU1 (WWTP Landfill)



# AWI OU1 (WWTP Landfill)

**WELCOME TO  
THE ARMSTRONG MACON MEADOW**

*A Landfill Transformation*

**Armstrong®  
WORLD INDUSTRIES**

**Native Wildflower Meadow**



*Bumble Bee (Bombus spp.)*



**Ruby-throated Hummingbird  
(Archilochus colubris)**



**Fritillary (Speyeria spp.)**



**Meadow Blanketed with Asters**



The Armstrong World Industry (AWI) Wastewater Treatment Plant (WWTP) Landfill was transformed into a thriving pollinator meadow. The pollinator meadow is planted with over 20 locally native plants representing the natural history of central Georgia and provides habitat for bees, butterflies, birds, and other species. These include lyreleaf sage (*Salvia lyrata*), fleabane (*Erigeron annuus*), bee balm (*Monarda fistulosa*), Foxglove Beardtongue (*Penstemon digitalis*), and common milkweed (*Asclepias syriaca*). The 4.5 acres of habitat supports the 2015 White House National Pollinator Strategy goal of restoring and enhancing 7 million acres for pollinators throughout the country. The pollinator meadow was developed through the combined efforts of Armstrong World Industries, US EPA, Ramboll Environ, and the Pollinator Partnership.

**You Are Here**



Tall Grass and Milkweed along  
Tall and Wall top

Monarch Butterfly

Butterfly

Bee

Hummingbird

N


RAMBOLL ENVIRON POLLINATOR PARTNERSHIP

# AWI OU2 Sampling

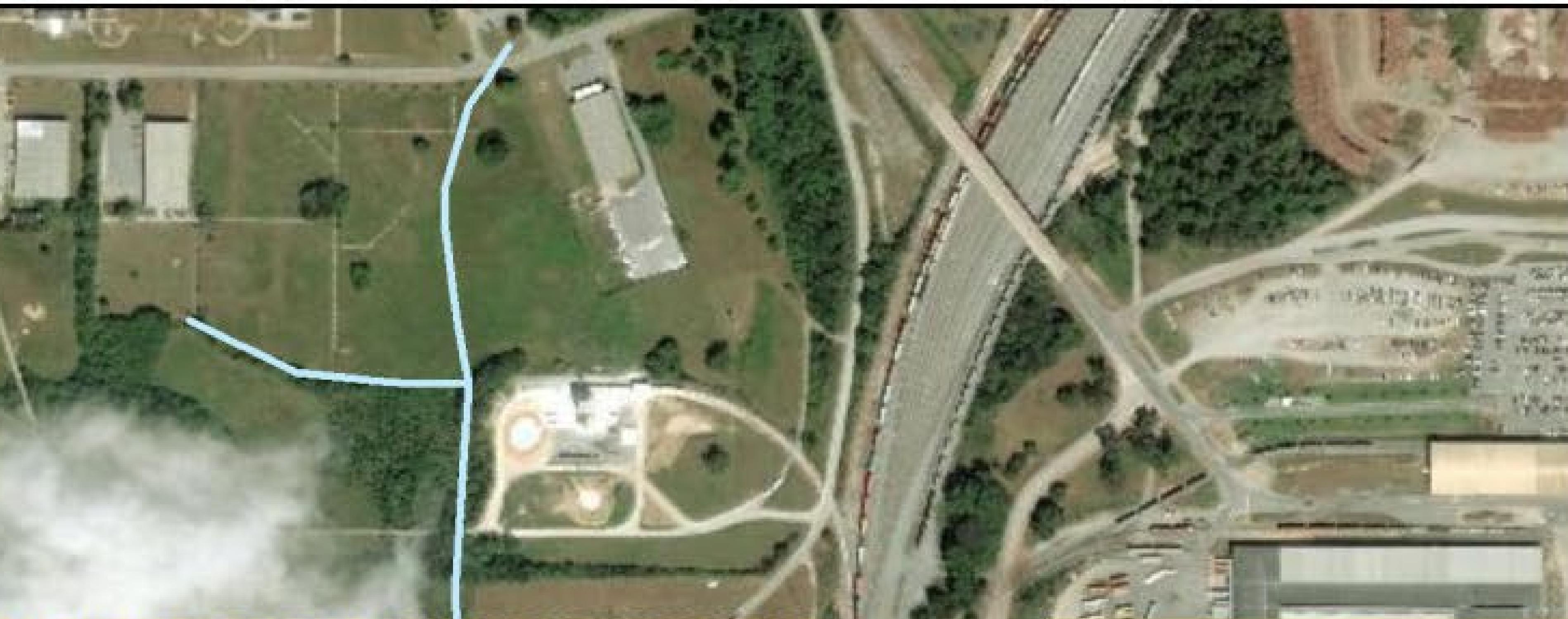
Type	# Areas/Locations	# Sample Aliquots	Primary Chemical Groups
Soil	20	> 1,800	Metals, PAHs, PCBs
Sediment	15	> 1,350	Metals, PAHs, PCBs
Surface Water	11	11	Metals, PCBs, Chlorinated Ethenes (TCE)
Groundwater	21	21	Metals, PCBs, Organics (including TCE)
Fish	7	105	PCBs, Mercury



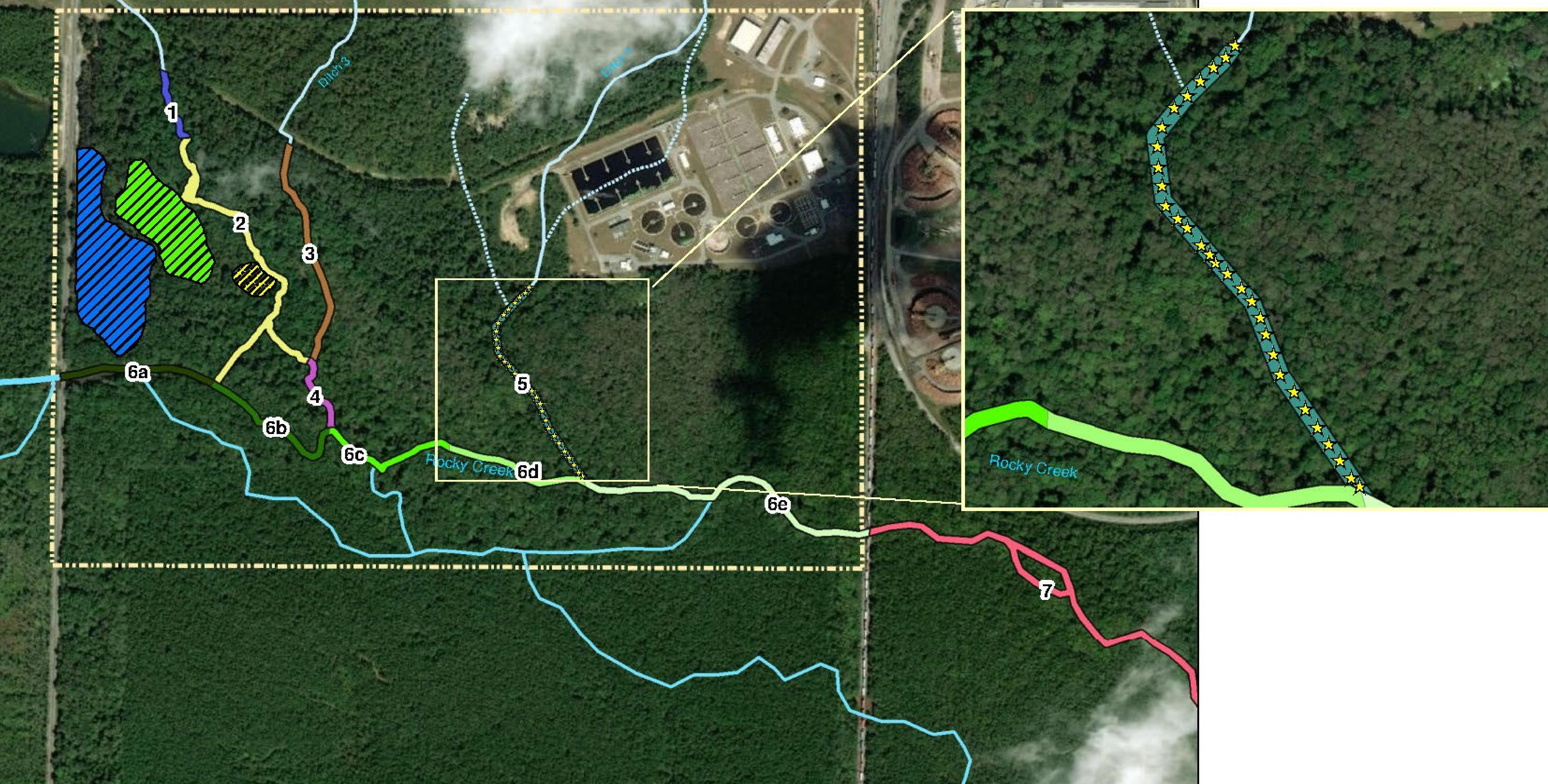
# AWI OU2 Soil Sampling




# AWI OU2 Sediment Sampling




Legend
Landfills (approx)
FMNOL
Remote Landfill
Explosives Demo Area
Example Aliquots
OU2 (approx)



# AWI OU2 Surface Water Sampling



# AWI OU2 Fish Sampling




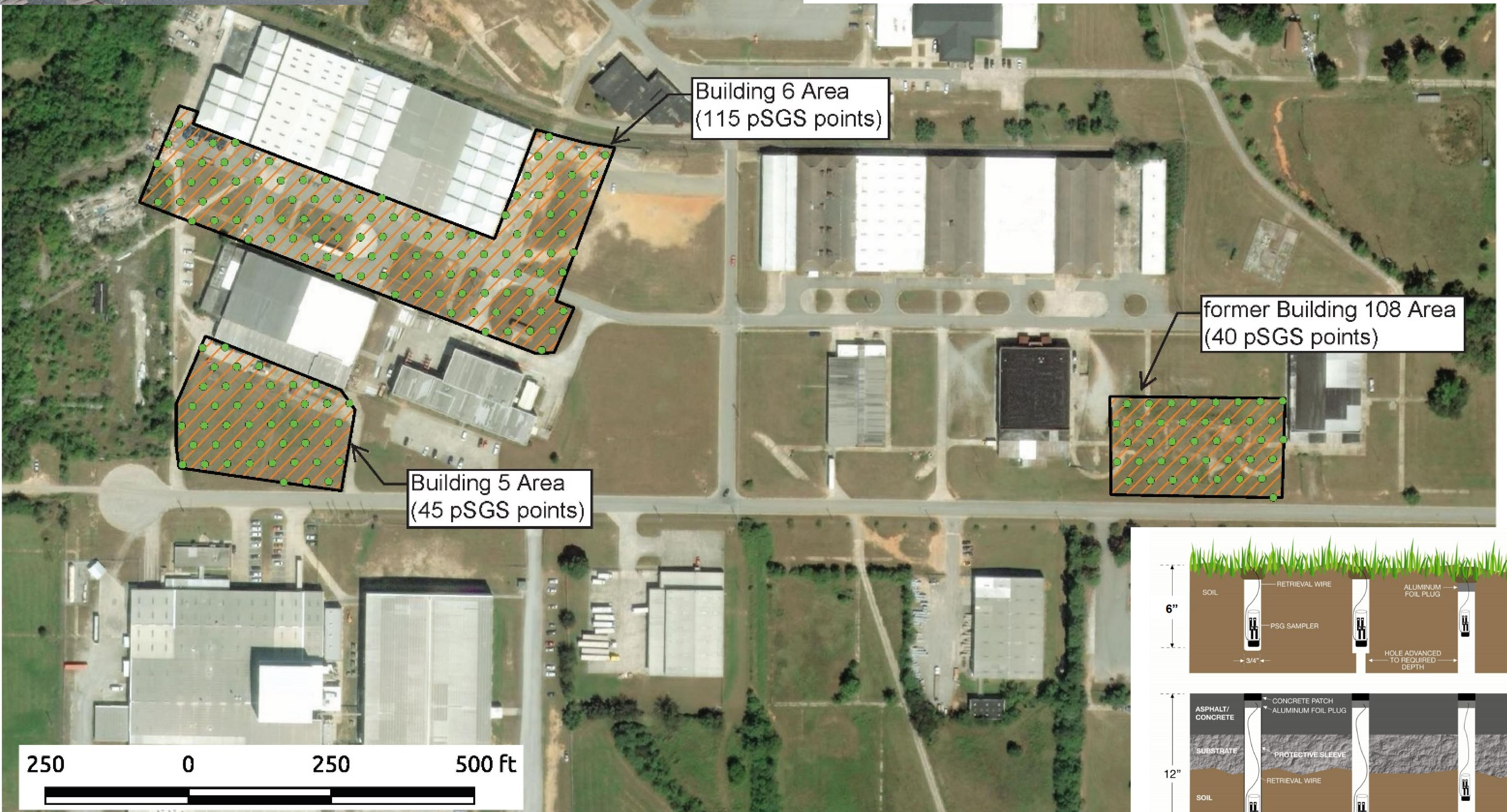
# MNOP Remedial Investigation

- 138 Groundwater samples from existing wells and soil borings
- 220 passive soil gas samples
- Soil borings advanced to collect 84 subsurface soil samples
- 20 soil borings adjacent to former manufacturing and solvent storage areas
- Incremental composite samples of surface soil from 20 acres / over 150 individual increments collected
- Grab surface soil samples
- 34 Sub Slab Soil Gas and Indoor Air Samples to update the existing information on potential vapor intrusion in 8 buildings



# MNOP Groundwater Sampling





## MNOP Passive Soil Gas Sampling

# MNOP Sub-slab Soil Gas and Indoor Air Sampling



# MNOP Surface Soil Sampling

